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WOLF GREENFIELD & SACKS, P.C.
600 ATLANTIC AVENUE
BOSTON, MA 02210-2206

EXAMINER

FETZNER, TIFFANY A

ART UNIT	PAPER NUMBER
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2859

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/527,592

Applicant(s)

SODICKSON ET AL.

Examiner

Tiffany A. Fetzner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-119 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-119 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

2. **Claims 43 and 74** are objected to because of the following informalities:
A) Applicant's specification discloses an S1 parameter not an S11 parameter. The S'11's should to be corrected to S1's where appropriate in these claims. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. **Claims 1-119** are rejected under **35 U.S.C. 102(e)** as being anticipated by **Mills** US patent **6,477,398 B1** issued November 5th 2002, filed November 12th 1998.

With respect to **Claim 1**, **Mills** shows from figures 1a, 1b, 8 and 13, in combination with the supportive text for these figures in the disclosure. "A method of determining one or more properties of a body" (i.e. component 114) "positioned proximate an array of coils" (i.e. coil array 120) "having one or more resonant properties" (abstract), "the method comprising acts of: detecting a change in at least one resonant property of at least one of the coils in the array; and determining at least

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one electromagnetic property of at least one region of the body from the change in the at least one resonant property." [See col. 2 line 26 through col. 5 line 17; col. 27 line 57 through col. 33 line 21; col. 54 line 21 through col. 59 line 16 as examples.]

With respect to **Claim 33 Mills**, shows with respect to figures 1 through 13 and their accompanying description within the Mills disclosure "A method of determining one or more properties" (i.e. such as magnetic susceptibility) "of a body" (i.e. of a patient or object), "the method comprising acts of: positioning the body proximate a plurality of coils;" [See figures 1a, 1b, 8, 13 and accompanying description] "measuring at least one property of at least one of the plurality of coils;" [See figures 1a, 1b, 8, 13 and accompanying description] "and determining at least one electromagnetic property of at least one region of the body from the at least one property" [See abstract, col. 2 line 27 through col. 4 line 65] "based on at least two of a resistive coupling, a capacitive coupling, and an inductive coupling between at least two of the plurality of coils." [See figures 1a, 1b, 8, and 13, which show the resistive and inductive couplings between the coils.]

With respect to **Claim 61 Mills**, shows with respect to figures 1 through 13 and their accompanying description within the Mills disclosure "An apparatus for determining one or more properties of a body, the apparatus comprising: a plurality of coils having one or more resonant properties;" [See figures 1a, 1b, 8, a 13] These figures show, in combination with their accompanying description of the **Mills** disclosure "a first component coupled to the plurality of coils and adapted to provide at least one measurement of the plurality of coils indicative of a change in at least one resonant property of at least one of the plurality of coils; and a second component coupled to the first component to receive the at least one measurement, the second component adapted to determine at least one electromagnetic property of at least one region of the body based on the change in the at least one resonant property." [See also the abstract, and the text of col. 11 line 66 through col. 81 line 14 with respect to the figures and the functions of the shown components.]

With respect to **Claim 91 Mills**, shows with respect to figures 1 through 13 and their accompanying description within the Mills disclosure An apparatus for determining

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one or more properties of a body, the apparatus comprising: a plurality of coils;" [See figures 1a, 1b, 8, a 13] These figures show, in combination with their accompanying description of the **Mills** disclosure "a first component coupled to the plurality of coils, the first component adapted to provide at least one measurement of at least one property of the plurality of coils; and a second component coupled to the first component to receive the at least one measurement, the second component adapted to determine at least one electromagnetic property of at least one region of the body from the at least one measurement based on at least two of a resistive coupling, a capacitive coupling, and an inductive coupling between two or more of the plurality of coils." [See also the abstract, and the text of col. 11 line 66 through col. 81 line 14 with respect to the figures and the functions of the shown components.]

With respect to **Claim 2**, and **corresponding claim 62**, **Mills** teaches "detecting a change in at least one resonant frequency" [See abstract] "of at least one of the coils in the array" [See component 120, and the accompanying text in the disclosure]. The same reasons for rejection, which apply to **claims 1, 61** also apply to **claims 2, 62** and need not be reiterated.

With respect to **Claim 3**, and **corresponding claims 34, 63** and **92** which depend from **independent claims 33, 61**, and **91** respectively: **Mills** teaches "determining at least one of a conductivity, a permittivity, and a permeability of the at least one region of the body." [See col. 4 lines 46-51] The same reasons for rejection, which apply to **claims 1, 33, 61, 91** also apply to **claims 3, 34, 63** and **92** and need not be reiterated.

With respect to **Claims 4, 5**, and **corresponding claims 35, 36, 64, 65**, and **93** which depend from **independent claims 33, 61**, and **91** respectively: **Mills** teaches "determining at least one of a magnitude, a direction, and a phase of an electromagnetic (i.e. electric **claims 4, 35, 64, 93**) and (i.e. magnetic **claim 5, 36, 65, 93**) field at the at least one region of the body." [See col. 6 line 16 through col. 10 line 21] The same reasons for rejection, which apply to **claims 1, 33, 61, 91** also apply to **4, 5, 35, 36, 64, 65**, and **93** and need not be reiterated.

With respect to **Claim 6**, and **corresponding claims 37, 66** Mills teaches "forming an image having a plurality of voxels, each voxel of the plurality of voxels having an intensity related to a respective one of the at least one electromagnetic property." [See col. 20 lines 42-65 as one example of this teaching.] The same reasons for rejection, which apply to **claims 1, 33, 61** also apply to **claims 6, 37, 66** and need not be reiterated.

With respect to **Claim 7**, Mills teaches "measuring at least one property of the array of coils" (i.e. the frequency) "indicative of the change in the at least one resonant property" (i.e. the magnetic susceptibility) [See col. 19 line 23 through col. 20 line 65 as one example]. The same reasons for rejection, which apply to **claim 1** also apply to **claim 7** and need not be reiterated.

With respect to **Claim 8**, and **corresponding claims 38, 67 and 94** Mills teaches "measuring an impedance characteristic of at least one of the coils in the array." [See col. 12 lines 55-57; col. 20 lines 27-31; col. 56 lines 26-54.] The same reasons for rejection, which apply to **claims 1, 7, 33, 61, 91** also apply to **claims 8, 38 67, 94** and need not be reiterated.

With respect to **Claim 9** and **corresponding claims 39, 68 and 95**, Mills teaches "measuring an impedance characteristic includes an act of obtaining a measured impedance matrix of the array of coils." [See col. 20 lines 27-65] The same reasons for rejection, which apply to **claims 1, 7, 8, 33, 38, 61, 67, 91, 94** also apply to **claims 9, 39, 68 and 95**, and need not be reiterated.

With respect to **Claim 10**, and **corresponding claims 40, 69 and 96**, Mills teaches "obtaining a plurality of scattering parameters (S-parameters) of the array of coils" because the Magnetic susceptibility parameters which define and determine how the electromagnetic field fluctuates in space, represent a plurality of electromagnetic field scattering parameters." [See the entire disclosure of Mills with respect to magnetic susceptibility and the parameters used to define, determine and measure it in the Mills reference. [See the abstract, figures 1a-13; col. 2 line 26 through col. 81 line 48.] The same reasons for rejection, which apply to **claims 1, 7, 8, 33, 38, 61, 67, 91, 94** also apply to **claims 10, 40, 69 and 96**, and need not be reiterated.

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With respect to **Claim 11**, **Mills** shows "providing at least one electrical stimulus to at least one of the coils in the array." [See figures 1a, 1b, 8, and the accompanying text in the **Mills** disclosure.] The same reasons for rejection, which apply to **claims 1, 7** also apply to **claim 11** and need not be reiterated.

With respect to **Claims 12-17**, and **corresponding claims 44, 45, 100, 101**; **Mills** shows and teaches providing" (**claim 12**) "at least one of a current and a voltage to the at least one coil" [See figures 1a, 1b, 8 and 13; col. 28 lines 42-55 col. 30 line 50 through col. 32 line 46 as one example.]; (i.e. **claim 13**) "a range of frequencies and measuring at least one S-parameter of the array of coils." [See col. 20 lines 27-65]; (i.e. **claim 14**) "measuring a voltage in the at least one other of the coils in the array." [See figures 1a, 1b, 8 and 13; col. 28 lines 42-55 col. 30 line 50 through col. 32 line 46 as one example.] (i.e. **claims 15, 44, 100**) "measuring the at least one property" (i.e. such as current or voltage or magnetic susceptibility) "in each of the coils in the array. [See figures 1a, 1b, 8 and 13; col. 28 lines 42-55 col. 30 line 50 through col. 32 line 46 as one example.] (i.e. **claims 16, 45, 101**) "producing a current in each of the coils in the array and measuring a voltage in each of the coils in the array, respectively, in response to the current." [See figures 1a, 1b, 8 and 13; col. 28 lines 42-55 col. 30 line 50 through col. 32 line 46 as one example.]; (i.e. **claim 17**) "obtaining a measured impedance matrix formed from the plurality of S-parameters." [See col. 12 lines 55-57'; col. 20 lines 27-65; col. 56 lines 26-54; col. 28 lines 42-55 col. 30 line 50 through col. 32 line 46 as one example.] The same reasons for rejection, which apply to **claims 1, 7, 11, 33, 91** also apply to **claims 12-17, 44, 45, 100, 101** and need not be reiterated.

With respect to **Claim 18**, and **corresponding claims 46, 102**; **Mills** teaches "computing a trial impedance matrix from trial values of at least one of conductivity, permittivity and permeability for the at least one region of the body." [See col. 19 line 23 through col. 32 line 46 with col. 4 lines 46-65 as one example.] The same reasons for rejection, which apply to **claims 1, 7, 8, 33, 38, 61, 67, 91, 94** also apply to **claims 18, 46 and 102**, and need not be reiterated.

With respect to **Claim 19**, and **corresponding claims 47, 77, 103**: **Mills** teaches and shows "computing values of the trial impedance matrix by solving Maxwell's

equations" [see col. 178 line 47] with the trial values". See col. 19 line 23 through col. 32 line 46 with col. 4 lines 46-65 as one example; as well as all of the various equations drawn from the Maxwell equations found throughout the entire **Mills** disclosure.] The same reasons for rejection, which apply to **claims 1, 7, 8, 18, 33, 38, 46, 61, 67, 91, 94, 102** also apply to **claims 47, 77 and 103**, and need not be reiterated.

With respect to **Claim 20**, and **corresponding claims 48, 78, 104**: **Mills** shows the factors and parameters of the equation of this claim, via the numerous mathematics, equations, and array calculations set forth in the disclosure of col. 2 line 27 through col. 86 line 55 and figure 13 which teach the same principles in a long explanatory dissertation of mathematics. The same reasons for rejection, which apply to **claims 1, 7, 8, 18, 33, 38, 46, 47, 61, 67, 77, 91, 94, 102, 102** also apply to **claims 48, 78 and 104**, and need not be reiterated.

With respect to **Claim 21**, and **corresponding claim 49** **Mills** teaches from the disclosure section of Finite detector length, and the mathematics of the disclosure, the limitation of "computing the trial impedance matrix includes employing a finite difference time domain (FDTD) simulation of a model of the array and the body to compute a plurality of currents flowing in a plurality of coils in the array in response to a plurality of voltages and computing impedance characteristics from the plurality of currents and the plurality of voltages." [See col. 57 line 6 through col. 81 line 14; Figure 13.] The same reasons for rejection, which apply to **claims 1, 7, 8, 18, 33, 38, 46, 47, 61, 67, 77, 91, 94, 102, 102** also apply to **claims 21 and 49**, and need not be reiterated.

With respect to **Claim 22**, and **corresponding claims 50, 79, 105** **Mills** teaches "comparing the trial impedance matrix with the measured impedance matrix", from the teachings of col. 20 line 27-65; col. 19 line 44 through col. 20 line 31; col. 29 line 64 through col. 32 line 46; col. 56 lines 31-54, Figure 13]. The same reasons for rejection, which apply to **claims 1, 7, 8, 18, 33, 38, 46, 47, 77, 61, 67, 91, 94, 102, 103** also apply to **claims 50, 79 and 105**, and need not be reiterated.

With respect to **Claims 23, 24, 25**, and **corresponding claims 51, 52, 33, 80, 81, 82, 106, 107, 108**, **Mills** teaches "iteratively updating " (i.e. claims 25, 82, 107) " in order to enable reducing a distance between the trial impedance matrix which is

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expressed as (i.e. susceptibility and detected in terms of voltage) and the measured impedance matrix" (i.e. the values actually detected) (i.e. claims 24, 51, 80) because Mills measures impedance for each of the antennas of the array in terms of detected signal voltage and brings the estimated and actual resulting voltages together. [See the teachings of col. 20 line 27-65; col. 19 line 44 through col. 20 line 31; col. 29 line 64 through col. 32 line 46; col. 56 lines 31-54]. Mills also shows mathematically that part of this method includes a least squares difference. [See the mathematical formulas provided throughout this reference connected with the taught reiterative, reconstruction method from the teachings of col. 20 line 27-65; col. 19 line 44 through col. 20 line 31; col. 29 line 64 through col. 32 line 46; col. 56 lines 31-54, figure 13] The examiner notes that the formulas are found throughout the text and in the appendices for each of the written described teachings, and not necessarily directly with the teachings themselves. Therefore applicant should refer to all the mathematics provided in the reference connected to the reconstruction algorithm employed by Mills.] The same reasons for rejection, which apply to **claims 1, 7, 8, 18, 21, 33, 38, 46, 47, 49, 61, 67, 77, 91, 94, 102, 102** also apply to **claims 51-53, 80-82, and 106-108**, and need not be reiterated.

With respect to **Claims 26, and corresponding claims 54, 83, 109, Mills** teaches "forming an image of the body, the image having a plurality of voxels, each voxel of the plurality of voxels having an intensity based on corresponding trial values used to compute the final trial impedance matrix. [See col. 25 line 30 through col. 32 line 46; figures 8, 1a, 1b] The same reasons for rejection, which apply to **claims 1, 7, 8, 18, 21, 33, 38, 46, 47, 49, 61, 67, 77, 91, 94, 102, 102, 51-53, 80-82, and 106-108**, also apply to **claims 26, 54, 83, and 109**, and need not be reiterated.

With respect to **Claims 27, and corresponding claims 55, 84, 110, Mills** shows "providing a model of the array of coils and the body. [See figures 1a, 1b] The same reasons for rejection, which apply to **claims 1, 7, 8, 26, 33, 38, 54, 61, 67, 83, 91, 94, 109** also apply to **claims 27, 55, 84 and 110**, and need not be reiterated.

With respect to **Claims 28, and corresponding claims 56, 85, 111, Mills** shows "logically partitioning a volume of space including at least a portion of the body into a plurality of regions". [See figure 12] The same reasons for rejection, which apply to

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claims 1, 7, 8, 26, 27, 33, 38, 54, 55, 61, 67, 84, 91, 94, 109, 110 also apply to **claims 28, 56, 85** and **111**, and need not be reiterated.

With respect to **Claims 29**, and **corresponding claims 57, 86, 112**, **Mills** teaches "assigning at least one of a conductivity value, a permittivity value, and a permeability value to each of the plurality of regions. [See col. 4 lines 46-51] The same reasons for rejection, which apply to **claims 1, 3, 7, 8, 26, 27, 28, 33, 34, 38, 54, 55, 56, 61, 63, 67, 84, 85, 91, 92, 94, 109, 110, 111** also apply to **claims 29, 57, 86** and **112**, and need not be reiterated.

With respect to **Claims 30**, and **corresponding claims 58, 87, 113**, **Mills** teaches "computing a trial impedance matrix from the assigned conductivity, permittivity and permeability values according to the model". [See col. 4 lines 46-51 where permeability different than free space is defined as magnetic susceptibility, and see the teachings of col. 20 line 27-65; col. 19 line 44 through col. 20 line 31; col. 29 line 64 through col. 32 line 46; col. 56 lines 31-54, Figure 13]. The same reasons for rejection, which apply to **claims 1, 3, 7, 8, 26, 27, 28, 29, 33, 34, 38, 54, 55, 56, 57, 61, 63, 67, 84, 85, 86, 91, 92, 94, 109, 110, 111, 112** also apply to **claims 30, 58, 87** and **113**, and need not be reiterated.

With respect to **Claims 31**, and **corresponding claims 59, 88, 114**, **Mills** teaches "reducing a distance between the trial impedance matrix and the measured impedance matrix by iteratively adjusting trial values of the assigned conductivity and permittivity values" because he adjusting the magnetization voltages detected by each voxel. [See col. 4 lines 46-51 where permeability different than free space is defined as magnetic susceptibility, and see the teachings of col. 20 line 27-65; col. 19 line 44 through col. 20 line 31; col. 29 line 64 through col. 32 line 46; col. 56 lines 31-54, Figure 13]. The same reasons for rejection, which apply to **claims 1, 3, 7, 8, 26, 27, 28, 29, 30, 33, 34, 38, 54, 55, 56, 57, 58, 61, 63, 67, 84, 85, 86, 87, 91, 92, 94, 109, 110, 111, 112, 113** also apply to **claims 31, 59, 88** and **114**, and need not be reiterated.

With respect to **Claims 32**, and **corresponding claims 60, 89, 115**, **Mills** shows "performing a finite difference time domain simulation of the mode" [See figures 1c through figure 7, as examples with their corresponding description in the Mills

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disclosure. See also the plotting of the results col. 32 lines 43-46]. The same reasons for rejection, which apply to **claims 1, 3, 7, 8, 26, 27, 28, 29, 30, 31, 33, 34, 38, 54, 55, 56, 57, 58, 59, 61, 63, 67, 84, 85, 86, 87, 88, 91, 92, 94, 109, 110, 111, 112, 113, 114** also apply to **claims 32, 60, 89, and 115**, and need not be reiterated.

With respect to **Claim 41**, **Mills** shows from figures 1a and figure 8 by means of the drive mechanism and the electrical connection shown the step of "providing a current in at least one of the plurality of coils" (i.e. component 120) "and measuring the at least one property in at least one other of the plurality of coils" {see the abstract, figure 13, figure 8, figure 2 and the teachings of col. 20 line 27-65; col. 19 line 44 through col. 20 line 31; col. 29 line 64 through col. 32 line 46]. The same reasons for rejection, which apply to **claims 1, 7, 8, 10, 33, 38, 40, 61, 67, 69, 91, 94, 96** also apply to **claim 41** and need not be reiterated.

With respect to **Claim 42**, **Mills** teaches "measuring a voltage in the at least one other of the plurality of coils" [See col. 31 line 62 through col. 32 line 46 as one example of this teaching in the **Mills** reference]. The same reasons for rejection, which apply to **claims 1, 7, 8, 10, 33, 38, 40, 41, 61, 67, 69, 91, 94, 96** also apply to **claim 42** and need not be reiterated.

With respect to **Claim 43**, **Mills** teaches "measuring an **S1** [See objection to **S11**] parameter of the at least one other of the plurality of coils. [See the teachings of col. 20 line 27-65; col. 19 line 44 through col. 20 line 31; col. 29 line 64 through col. 32 line 46; col. 56 lines 31-54, Figure 13]. The same reasons for rejection, which apply to **claims 1, 7, 8, 10, 33, 38, 40, 41, 42, 61, 67, 69, 91, 94, 96** also apply to **claim 43** and need not be reiterated.

With respect to **Claim 70**, and **corresponding claim 97** **Mills** teaches impedance matching [See col. 20 lines 27-33, and shows a matching circuit and a network analyzer" from figures 13, 8, 1a, and 1b] The same reasons for rejection, which apply to **claims 61, 96** also apply to **claims 70, 97** and need not be reiterated.

With respect to **Claim 71**, and **corresponding claim 98**, **Mills** shows from figures 8 and 13 "a third component adapted to provide a current in at least one of the plurality of coils and the first component is adapted to measure the at least one property

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in at least one other of the plurality of coils in response to the current. The same reasons for rejection, which apply to **claims 1, 7, 8, 33, 38, 40, 61, 67, 69, 91, 94, 95, 96** also apply to **claims 71, 98** and need not be reiterated.

With respect to **Claim 72**, and **corresponding claim 99** Mills shows from figures 1a, 1b, 8 and 13 "the third component includes an radio frequency (RF) power source. The same reasons for rejection, which apply to **claims 1, 7, 8, 33, 38, 40, 61, 67, 69, 71, 91, 94, 95, 96** also apply to **claims 72, 99** and need not be reiterated.

With respect to **Claim 73**, Mills shows from figures 1a, 1b, 8 and 13; and teaches from col. 20 line 27-65; col. 19 line 44 through col. 20 line 31; col. 29 line 64 through col. 32 line 46; the ability to "measure a voltage in the at least one other of the plurality of coils in response to the current." The same reasons for rejection, which apply to **claims 1, 7, 8, 33, 38, 40, 61, 67, 69, 71, 91, 94, 96** also apply to **claims 73** and need not be reiterated.

With respect to **Claim 74**, Mills shows from figures 1a, 1b, 8, and 13; in combination with the teachings of col. 19 line 44 through col. 20 line 31; col. 29 line 64 through col. 32 line 46; that "the first component is adapted to measure an **S1** parameter of the at least one other of the plurality of coils at a plurality of frequencies." The same reasons for rejection, which apply to **claims 1, 7, 8, 33, 38, 40, 61, 67, 69, 71, 73, 91, 94, 96** also apply to **claims 74** and need not be reiterated.

With respect to **Claim 75**, Mills shows from figures 1a, 1b, 8, and 13; in combination with the teachings of col. 19 line 44 through col. 20 line 31; col. 29 line 64 through col. 32 line 46; that "the first component is adapted to measure the at least one property in each of the other coils in the array in response to the current." The same reasons for rejection, which apply to **claims 1, 7, 8, 9, 33, 38, 39, 61, 67, 68, 91, 94, 95** also apply to **claim 75** and need not be reiterated.

With respect to **Claim 76**, Mills teaches the second component is adapted to compute a trial impedance matrix from trial values of at least one of conductivity and permittivity for the at least one region of the body" because he adjusting the magnetization voltages detected by each voxel. [See col. 4 lines 46-51 where permeability different than free space is defined as magnetic susceptibility, and see the

teachings of col. 20 line 27-65; col. 19 line 44 through col. 20 line 31; col. 29 line 64 through col. 32 line 46; col. 56 lines 31-54, Figure 13]. The same reasons for rejection, which apply to **claims 1, 7, 8, 9, 33, 38, 39, 61, 67, 68, 91, 94, 95** also apply to **claim 76** and need not be reiterated.

With respect to **Claim 90**, and **corresponding claim 116**, **Mills** teaches in the appendices of the Disclosure, the text of col. 11 line 34 through col. 82 line 14, and the exemplary reconstruction program of column 42 through 54 of the Mills Disclosure "at least one computer readable medium encoded with instructions; and at least one processor coupled to the at least one computer readable medium, the at least one processor configured to execute the instructions." [See also figures 1a, 1b, and 8, which show the different computational processors 20, 126, 226, and 228] The same reasons for rejection, which apply to **claims 61, 91** also apply to **claim 116** and need not be reiterated.

With respect to **Claim 117**, **Mills** teaches and shows in the appendices of the Disclosure, the text of col. 11 line 34 through col. 82 line 14, and the exemplary reconstruction program of column 42 through 54 of the Mills Disclosure "A computer readable medium encoded with instructions capable of being executed on at least one processor, the instructions, when executed by the at least one processor, performing a method of determining one or more properties of a body positioned proximate a coil array, the method comprising acts of: defining an electromagnetic model of the coil array; receiving an input including a measured impedance matrix of the coil array; logically partitioning a volume associated with the model of the coil array and the body into a plurality of regions; assigning trial values respectively to each of the plurality of regions, the trial values including at least one of conductivity, permittivity and permeability; generating a trial impedance matrix from the assigned trial values according to the electromagnetic model of the coil array; and reducing a distance between the trial impedance matrix and the measured impedance matrix."

With respect to **Claim 118**, **Mills** teaches and shows "generating the trial impedance matrix by implementing a finite difference time domain simulation of the model." [See figures 1c through figure 7, and figure 13 as examples with their

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corresponding description in the Mills disclosure. See also the plotting of the results col. 32 lines 43-46]. The same reasons for rejection, which apply to **claim 117** also apply to **claim 118** and need not be reiterated.

With respect to **Claim 119**, **Mills** teaches and shows from the algorithms shown throughout the Mills reference that "the act of reducing the distance includes determining a least squares distance between the trial impedance matrix and the measured impedance matrix by iteratively updating the conductivity and permittivity values such that the trial impedance matrix is closer to the measured impedance matrix on each iteration" [See the mathematics' and algorithms found throughout the **Mills** reference. . See also col. 4 lines 46-51 where permeability different than free space is defined as magnetic susceptibility, and see the teachings of col. 20 line 27-65; col. 19 line 44 through col. 20 line 31; col. 29 line 64 through col. 32 line 46; col. 56 lines 31-54, Figure 13]. The same reasons for rejection, which apply to **claim 117** also apply to **claim 119** and need not be reiterated.

Prior Art

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

***A) Sekihara et al.**, Us patent 5,426,365 issued June 20th 1995.

B) Sodickson et al., US patent application publication 2006/ 0125475 A1 published June 15th 2006, which is applicant's own publication of the instant application, which is noted for purposes of a complete record only.

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Conclusion

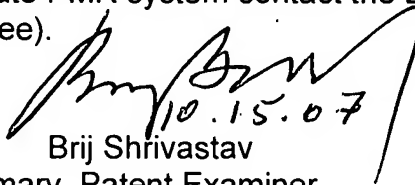
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: (571) 272-2241. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Dean Reichard**, can be reached at (571) 272-1984. The **only official fax phone number** for the organization where this application or proceeding is assigned is **(571) 273-8300**.

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TAF
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Brij Shrivastav
Primary Patent Examiner
Technology Center 2800